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Rosalie J. Hall Terrence L. Kay

THE UNIFORM CHART OF ACCOUNTS:

A DESCRIPTION WITH COMMENTS ON

POTENTIAL USE WITH CASE MIX DATA

Research Paper 4-84 October 1984





Research Department Naval School of Health Sciences Bethesda, Maryland 20814-5033

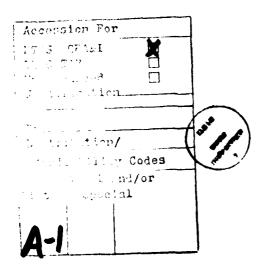
12 03 050 THE UNIFORM CHART OF ACCOUNTS: A DESCRIPTION WITH COMMENTS ON POTENTIAL USE WITH CASE MIX DATA

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- **Mathematical Statistician



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THE UNIFORM CHART OF ACCOUNTS:

A Description With Comments on Potential Use With Case Mix Data

Background and Perspective

The Research Department at the Naval School of Health Sciences, Bethesda, Maryland, has been conducting patient case mix related research for the past three years. During this time, the utility of Diagnosis Related Groups (DRGs) to monitor average length of patient stay and convalescent leave for active duty patients has been demonstrated (1,2,3,4). Current case-mix related efforts are being directed towards the development of nospital reimbursement methods that account for differences in the types of patients being treated. One option for military hospitals would be to adopt the DRG-based cost figures already in use by the Department of Health and Human Services for reimbursement of Medicare cases(5). An alternative solution would be to develop a set of military specific DRG cost figures that would take into account special characteristics of treatment in a military setting. This could be accomplished by interweaving the current cost accounting system used by the Navy Medical Command (the Uniform Chart of Accounts) with a resource allocation process based upon patient case mix to create a measure of average cost per patient within the DRG groupings.

To explore the possibilities of combining DRG information and UCA data to derive cost of treeing patients in military hospitals, it is first necessary to have a general knowledge of UCA. An introduction to the key terms and concepts of the UCA is provided in this report. In addition, comments specific to issues involved in combining the UCA data with other sources of information about patients in military hospitals have been addressed.

Introduction to the UCA System

The Uniform Chart of Accounts (UCA) is a cost accounting system unique to military fixed medical treatment facilities. It had its inception when the Departments of Defense (DOD), Health, Education, and Welfare (DHEW), and Office of Management and Budget (OMB) conducted a joint study of the military health care system (1973-1975). The group's recommendations were published as a report in late 1975 (6). In response to some of the issues raised in the study, a decision was made by DOD to create an accounting system which would provide a common data base of military medical cost information. The result was the UCA, which was tested in 1978 and 1979, and implemented in the three services starting in FY 80.

According to the UCA manual published by DOD (7), the objectives of the system are to provide:

- 1) a single tri-service chart of accounts;
- common definitions for workload, cost elements, and work centers;
- 3) a basis for management reports;
- 4) a means of measuring performance for:
 - (a) internal comparisons (within hospitals),
 - (b) inter-service comparisons.
 - (c) intra-service comparisons, and
 - (d) civilian sector comparisons;
- 5) a mechanism to measure efficiency and cost effectiveness; and
- 6) a common mechanism for the assignment of overhead and ancillary service expenses.

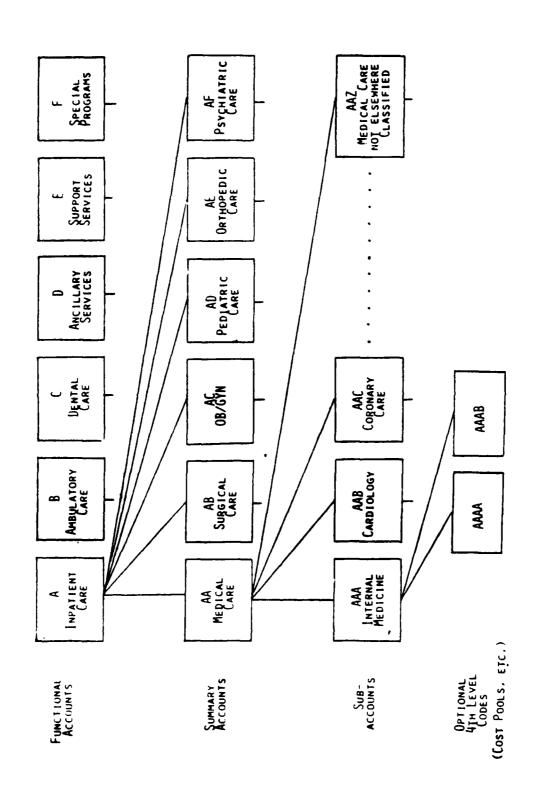
A particularly attractive feature of the UCA is that it has been designed to meet cost accounting needs for individual facilities while still providing expense and workload data that may be both compared and aggregated with information from other facilities. This is possible because of shared standardized procedures and definitions.

Structure of UCA Account Codes

The account codes to which expenses are allocated go to a depth of four levels, ranging from very general to very specific (See Figure 1). The highest level account is called a functional account. There are six major functional accounts: two accounts designated as intermediate functional accounts -- Ancillary Services and Direct Services, and four final functional accounts -- Inpatient Care, Ambulatory Care, Dental Care, and Special Programs. Expense and performance information is initially accumulated into all six functional accounts. However, costs accumulated initially into the two intermediate functional accounts represent indirect costs which must later be reallocated to the four final functional categories. Each of these functional accounts is coded with a single alphabetic character as follows: A - Inpatient Care, B - Ambulatory Care, C - Dental Care, D - Ancillary Services, E - Support Services, F - Special Programs. All of the costs of a medical treatment facility will fall into one of these categories. The categories are so broad, however, that it is helpful to break them down into more specific second, thira, and even fourth level accounts.

down into one or more summary accounts. For example, Inpatient Care (A)

FOUR LEVEL ACCOUNTING CODE STRUCTURE



4

contains six summary accounts, each with a unique second level account code: medical (AA), surgical (AB), OB/GYN (AC), pediatric (AD), orthopedic (AE), and psychiatric (AF) care. Some of these summary accounts are further subdivided into more detailed third level accounts.

The third level account, called a subaccount, reports cost information at the level of the work center. The work center is a functional or organizational subdivision of the medical facility that: accumulates identifiable, significant expenses; occupies physical space and has assigned manpower; produces a meaningful work output; and provides a unique service. In addition, its function is assigned or authorized by higher authority (7). (See Appendix A for a more detailed definition.) Specific examples of work centers include internal medicine, pathology, lab, and command administrative support services. To continue with the example begun above, under the summary account medical care (AA) fall the subaccounts of internal medicine (AAA), cardiology (AAB), coronary care (AAC), and so on through the final medical care subaccount: "medical care not elsewhere classified" (AAZ).

The fourth level account codes are primarily for internal use by the reporting facility. These optional codes are assigned meaning by the individual facility and may be used for purposes such as accounting for costs shared by specialty services on a single ward.

overview of the UCA Process

The overall process of producing UCA data and summary reports consists of the following steps:

- accumulation by work center of financial, personnel, patient, and facilities data from existing sources within each facility;
- 2) purification of the data collected in the previous step (involves reassigning expenses from one work center to one or more other expense accounts);
- redistribution of intermediate expense account costs (support services and ancillary services) to final operating expense accounts (stepdown procedure);
- 4) production of the major summary report (the medical Expense and Performance Report, or MEPK).

Each of these steps is discussed in more detail in the following sections of this report.

Data Accumulation

Mather than require the facilities to duplicate existing management information systems, the UCA uses as its source of cost information data which have already been gathered by previously existing systems. In most cases, these data are adequate for direct use in the UCA or can be modified easily to fit the UCA requirements. The data are of two general types: expense information and performance measures.

Expense data includes any information, reported in dollar amounts, about the value of the transactions and events of each work center. Each work center has its own operating expense account (OEA) into which direct cost information is accumulated. First, all non-personnel expenses are assigned to both intermediate and final OEAs. These expenses include depreciation of any medical or dental equipment, purchased through a source other than Navy supplies, which has a value of over \$3,000. It is during this step that the full-time equivalent (FTE) man-months to be charged to each account are determined. Based upon the FTE's, salary expenses for civilian and military employees are charged to the appropriate work centers. At the end of this stage of the processing, all costs have been assigned to an operating expense account. In later steps some of these costs will be reassigned to reflect resource consumption of ancillary and support services by work centers providing direct patient care/services.

In addition to the expense information, each work center collects performance factors. These are measures of the work produced by a given function which, when divided into the total costs for that function, give a cost per workload ratio. The cost per workload ratio is a variation of the classic efficiency measure, a comparison of outputs to inputs. (See Table 1 for a listing of the individual UCA work centers and their associated performance factors). For example, consider the Internal Medicine work center whose functions are to: 1) provide inpatient care and consultative service to patients suffering from medically related disease and illness, 2) maintain communicable disease facilities, 3) maintain liaisons with government authorities, and 4) provide subspecialty assistance where needed (7). The

operating expense account for the Internal Medicine work center will contain all of the operating expenses incurred in providing and maintaining these functions. The performance measure, or performance factor, associated with the Internal Medicine work center is the occupied bed day (OBD). After the purified and

Table 1
Statistical Data for Each UCA Work Center

Work Center(s)	Related <u>Statistical Data</u>	Work Center(s)	Related <u>Statistical Data</u>
spatient Care	Occupied Bed Day	Public Works	Various
bulatory Care	Visit	ii	
ental Care	Weighted Dental Pro-	Material Services	Dollars of Supply
	cedure/Prosthodontic Work Unit	Housekeeping and Janitorial Service	Hours of Service
cillary Services		Biomedical Equipment	Hours of Service
Pharmacy	Weighted Procedure	Repair	
Pathology	Weighted Procedure	Linen and Laundry Service	Pounds of Laundry
Radiology	Weighted Procedure	Inpatient Food Service	Rations Served
Special Procedures	Procedure	Inpatient Affairs	Occupied Bed Day
Services		Ambulatory Care	Outpatient Visite
Central Sterile Supply/	Hours of Service/	Administration	,
Material Service	\$ of Supplies	ļi.	
Surgical Services	Hours of Service		
Same Day Services	Hours of Service		
Rehabilitative Services	Visit _.	Special Programs	
Nuclear Medicine	Weighted Procedure	Specified Health Related Programs	Various
		Public Health Services	Various
ipport Services		Health Care Services	Verious
Depreciation	OBDS/Vieite	Support	
Command and Administrative	FTE Man Months	1	
Support Services		Military Unique Medical	Various
Personnel Support Services	Square Footage	Activities	
		Patient Movement and	
		Military Patient	

Source: LT Michael Jones, Head of Cost Accounting Accounting Section, Naval Medical Command

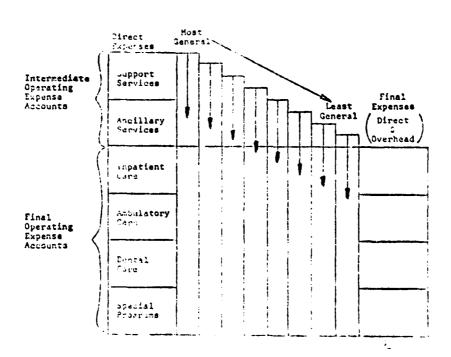
processed expense data have been assigned to the Internal Medicine work center, a cost performance ratio (cost per occupied bed day) is calculated and reported. Inis ratio can be used to compare cost per occupied bed day for inpatient care work centers within a hospital or to compare costs for similar work centers in other facilities. The performance measures are also used later in the stepdown and purification process to assign costs accumulated in indirect operating expense accounts to the appropriate direct care work centers. For example, the performance factor of weighted procedures would be used to calculate the proportion of the total expense incurred by the Radiology work center which will be reassigned to the Internal Medicine work center during the purification process.

Data Purification and Stepdown Procedure

Purification of the expense account information involves reassigning costs from one work center to one or more other expense accounts. For example, surgery patients who fall under more than one account code may be cared for on the same ward. Expense information for all of those patients is initially accumulated in one expense account representing the costs for the entire ward. Therefore, the costs for different types of patients have been "pooled" together. Before reporting the final expense figures, the cost pools must be proken down and reallocated to conform to the standardized expense account definitions. This purification process may be done either before (pre-purification) or after (post-purification) the stepdown procedure described below.

In the stepdown procedure, expense data is reallocated from the intermediate operating expense accounts in which it was initially accumulated to other intermediate operating expense accounts using their services, and lastly, to final operating expense accounts. Each intermediate expense account is stepped down (beginning with the most general of the intermediate accounts) then it is closed. Ultimately, all expense information is assigned to one of the four final operating expense accounts (see Figure 2). The rationale for this procedure is that work centers falling under the intermediate operating expense accounts provide services which constitute overhead for the work centers in the final operating expense accounts.

Figure 2
Stepdown Procedure for Assignment of Overhead Expenses



The intermediate OEA expenses are stepped down proportionally by workload data into the final OEAs. For example, Linen and Laundry Services accumulates \$150,000 in expenses in the first quarter. Inpatient Care makes use of the laundry services, using 3 of the total 4 tons that the laundry service provided during the first quarter. So, in the final OEA, three fourths of the \$150,000 spent by Linen and Laundry Services is reallocated to Inpatient Care as an expense. This procedure is repeated until all the expenses originally allocated to Linen and Laundry Services have been reassigned to final OEAs. This proportional reallocation of expenses occurs for all of the ancillary and support expenses, based upon the performance factors listed earlier in Table 1. The reallocation of funds is done by the computerized Expense Assignment System (EAS).

After the completion of the cost purification and stepdown procedures, management reports such as those discussed in the next section are produced.

Data Reporting

After UCA data have been processed through the Expense Assignment System, reports that summarize costs by work center within individual facilities are produced. These reports are created quarterly and include quarterly and up-to-date cost figures. Appendices 8 and C contain examples of such reports.

The Medical Expense/Performance Report (MEPR) (see Appendix 3) is the standardized output envisioned by the creators of the UCA. It reports cost information by subaccounts (third level of account codes). Contingent upon the validity and reliability of the data reported by the individual facilities, the

expense figures, performance factors, and efficiency ratios generated are comparable across facilities.

Several of the additional data displays produced in the process of generating the MEPR are of potential interest to decision making or management oriented research. One of these is the Fourth Level Detail Unit Cost Report (see Appendix C), which lists expenses, performance factors, and selected cost/performance ratios (e.g., cost per occupied bed day) for each account code down to fourth level specificity for an individual facility. In the process of preparing the report, the cost data are edited for obvious errors, and the corrected data resubmitted until the report is consistent with other records the facility maintains. The Fourth Level Report is produced mainly for the facility's internal use. However, because of the detailed breakdown of cost and performance information, it might be useful for tracing costs down as far as the level of an individual ward or functional activity (e.g., cardiology, germatology) for research purposes. Since fourth level codes are optional, there will be variability in the detail of the reports received from different facilities. A useful supplement to this report is the Computation Summary which lists separately the direct, stepped down, reallocated, and purified expenses for each account code, down to fourth level.

In addition to the MEPR, the Cost Accounting Section of the Naval Medical Command compiles individual level reports into a set of JCA program reports (JCAP). These reports display comparable expense figures in tabular form for all hospitals. For ease of comparison, many of the UCAP reports group each Naval Medical Command into one of seven activity groups, each of which is similar in size, expense, and to a certain extent, mission (all group A hospitals, for

example, are large, teaching hospitals). These reports contain very aggregated cost figures, presented in a format designed to facilitate inter-facility comparisons. (See the list of activity groups below in Table 2.) Inter-facility comparisons for the second quarter of 1983 are summarized under the following neadings: 1) analysis of functional categories; 2) analysis of inpatient care; 3) analysis of ambulatory care; 4) analysis of ancillary services; 5) dental expenses and workload; and 6) average cost per occupied bed day and outpatient visit.

Table 2
Naval Hospital Activity Groups, FY 82

GROUP A	GROUP E
Bethesda	Adak
Portsmouth, VA	Guantanamo Bay
San Diego	Roosevelt Roads
Oak land	Subic Bay
	Naples
GROUP B	Rota
Pensacola	Guam
Char leston	Yokosuka
Jacksonville	Ok i nawa
Long Beach	•
Great Lakes	GROUP F
Camp Lejeune	Portsmouth, NH
Camp Pendleton	Annapolis
	Quantico
GROUP C	Key West
Memph is	Seatt le
Beaufort	Port Hueneme
New London	New Orleans
Or lando	Pearl Harbor
Newport	
Bremerton	GROUP G
Philadelphia	Yuma
•	London
GROUP D	Idaho Falls
Corpus Christi	Cleveland
Cherry Point	Crane
Lemoore	Louisville
Whidbey Island	
Patuxent River	

Source: LT Michael Jones, Head of Cost Accounting Accounting Section, Naval Medical Command

Issues in the Use of UCA Data

UCA data can be used by medical department managers to 1) compare performance at the level of the ward, hospital, or service, and 2) allocate resources to hospitals and clinics. Managers should be aware, however, of several issues related to the use of UCA data.

--The UCA data do not account for differences in the case mix complexity of patients treated within each work center, therefore making comparisons among nospitals liable to misinterpretation.

--The MEPR report provides costs per occupied bed day (OBD), a statistic that is easily distorted by increasing patient length of stay. Because most of the costs associated with treating a patient tend to occur within the first few days of nospitalization, a hospital could easily reduce its cost per OBD by extending each patient's length of stay. Therefore, it might be useful to supplement OBD ratios with a report of cost per disposition. This ratio can be determined by dividing the cost data reported on the MEPR by the number of dispositions reported for each respective work center.

--The potential time lag between accumulation of data into operating expense accounts, submission of the expense and workload data for processing in the EAS, and receipt of a corrected MEPR may limit the usefulness of the UCA data for timely decision-making.

--Some editing of the data is done after the EAS has allocated the costs to work centers. This editing involves simple checks such as comparing the number of occupied bed days to the number of dispositions to ensure that the first number is larger than the second (see Expense/Workload Relationships in Appendix D for examples of the types of edit comparisons). More subtle errors such as the assignment of expenses to an incorrect work center are likely

to go undetected unless the reporting facility identifies or corrects them. This may cause problems when cost comparisons are made among different facilities.

--The use of cost pools may actually distort cost figures for some work centers. When costs are reallocated based upon a workload factor such as occupied bed day, a smoothing out, or an averaging effect occurs. The apparent costs of a work center with more intense resource consumption are likely to be deflated while the costs of the work center with less intense consumption are inflated. This gravitation toward the mean may make it more difficult to identify the true source of costs (3).

--The actual authority structure in a hospital may not closely correspond with the structure of the UCA system. This means that responsibility for controlling direct costs of a single work center may fall on more than one department head.

--Because the cost figures reported on the MEPR have been stepped down to include reporting of indirect costs and overhead of all final accounts, some sources of cost may actually be under the control of departments far removed from the work center. For example, control of cleaning costs may not be possible at the point of a medical, surgical, or ambulatory care work center; yet these costs contribute to the total costs reported on the MEPR for these work centers. In some instances management decisions should be based upon the expenses of a work center before the stepdown procedure has been done (this direct expense information is available from the Computation Summary).

--The cost figures reported are a mix of variable and fixed costs.

Typically, the greater the caseload, the lower the fixed cost per patient.

Erroneous conclusions may be drawn if the non-independence of caseload and cost per OBD is ignored.

Conclusion

The staff of the Research Department at the Naval School of Health Sciences plan a study of alternative methods for distributing resources to individual hospitals on the basis of average costs across all hospitals. The incorporation of a case mix measure such as diagnosis related groups (DRGs) may supply essential data for explaining cost and performance variations among facilities. Such a linkage would permit managers to refine the allocation process by reflecting the cost of treating the unique mix of patients cared for by each hospital. The UCA data issues discussed in this report need to be carefully addressed before these two systems can be integrated into a viable management tool.

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APPENDIX A

Definition of Work Center

WORK CENTER. A discrete functional or organizational subdivision of a military medical facility for which provision is made to accumulate and measure its expense and determine its workload performance. The minimum workcenters for a military medical facility are established by the prescribed operating expense accounts. Additional subordinate workcenters may be established by the military medical treatment facility. Generally the following criteria should be considered for establishing a workcenter:

- have identifiable expenses,
- have significant expenses,
- have allocated physical space,
- have allocated/assigned manpower,
- have meaningful work output,
- have a meaningful workload measure,
- have a uniqueness of service provided or expenses incurred when compared to other established work centers,
- have compatibility with the medical treatment facility organizational structure, and
 - facilitate management decision making process.

Specifically, the following criteria shall be satisfied to establish a work center:

- The performance of the function is one that is assigned or authorized by higher medical authority.
- Manpower (staffing) is assigned. Such staffing may or may not be authorized on the facility manning/staffing documents. In the areas of Inpatient Care, Ambulatory Care, and Dental Care, this is defined to mean that the medical or dental specialty or subspecialty is assigned.
 - Physical space to accomplish the workload is allocated and utilized.
 - Workload is generated.

APPENDIX A (cont'd)

If the aforementioned criteria are satisfied, then a work center will be established and expenses identified, collected, and reported as provided for in this Uniform Chart of Accounts. If physical space is allocated and utilized for the performance of a function, and the specialty/subspecialty (in the case of a ward or clinic) is provided on some periodic basis, through consultative service, contract offices, TAD or TDY expenses will be identified, collected, and reported only if they are considered to be significant by the medical treatment facility commander. Exceptions to the above criteria are:

- Reimbursement accounts,
- Summary accounts,
- Base operations accounts,
- Holding or variance accounts,
- Indirect cost pools.

From: Department of Defense Uniform
Chart of Accounts for Fixed Military
Medical and Dental Treatment Facilities,
Office of the Assistant Secretary of Defense
(Mealth Affairs) (DOD 6010.10-M: July, 1979)

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SECTION 2 - AMBULATORY SERVICES

APPENDIX B (continued)

PART II - ANCILLARY SERVICES	ANCILLARY SERVI	ces			
ACCI DESCRIPTION	DIRECT AND SUPPORT EXPENSE	ANCILARY	TOTAL Expense ASSIGNED	AMCILLAR V Servicës cost per Unit	COST PER
DC RADIOLOGY OTHER TOTAL	478977 88868 2515381	249697	478977 1138385 2765078	127659	3.7520
TOTAL	SUPPORT SERVICE	•			
ACCT DESCRIPTION E SUPPORT SERVICES	EXPENSES 3055 527		: !		
101AL 3055927	3055927 75927 7592741 8805844	!			

APPENDIX B (continued)

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FAL [: 1] Y	JUARTER .

SECTION	10N I - INPATIENT SERVICES					
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			EXPENSES			.000
444	INTERNAL MEDICINE	4950	1269013	0	22990	55.19
46C	CENERAL SORGERY [GFENSIVE CARE UNIT CENERICAL 1	\$124	2396853	0 (24430	98.11
ADA	PEDIATRICS	169	260009	90	1310	437.14
		10172	4926623	0	51904	6.46
SECT	SECTION 2 - AMBULATORY SERVICES	1		1		
19			OUTPATIE			
ALCI	ALCT DESCRIPTION	TOTAL EXPENSES	VISITS	INPAT	COST PER	:
844	INTERNAL MEDICINE CLINIC	471468	20346			
V99	GENERAL SURGERY CLINIC	310127	9124	• •	38.17	
4 4 4 6	PATALO CLINIC	254145	12745	0	19.94	!
10	EMERGENCY MEDICAL CARE	616446 505836	12792	0 0	30.82	
	TOTAL	2025864	64007	o'	31.65	
	PART II - ANCIL	ANCILLARY SERVICES	ces			
		DIRECT		TOTAL	ANC ILL AR	
777	DESCRIPTION	SUPPORT	ANCILARY	EXPENSE UNIT	SERVICES	COST PER
٧	PHARMACY	\$59430	10	559610	228820	

APPENDIX B (continued)

DETAIL UNIT COST REPORT	
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APPENDIX C

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APPENDIX P

UNIFORM CHART UF ACCUUNTS ANALYSIS JF INPATIENT CARE 20181-MOZ AS OF 07/06/83

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REPORT PERIOD: 2ND QUARTER 146 3 YEAR-TO-OATF

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MANC SA	HRMC SAN DIEGO	25,226,802	3,025,203	4.33	4.30	4.33 4.30 1.31 63 .92	:	.63	. 92	111.CM	151		4C2	20A 145	212	*22
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205	CAOUP NICHS	25,226,802	3,025,263 4.40 4.41 1.31 .86 .67 1.13 80,777	4.40	•	1.31	•	.67	1.13	1111	?		205	155	343 502 355 300	÷:

These facilities are grouped into categories composed of hospitals which are similar in size, expense, and admissions. This group (Activity Group A) is also similar in missionteaching. NOTE:

APPENDIX D (continued)

UNIFORM CMART OF ACCOUNTS ANALYSIS OF FUNCTIONAL CALFGORITS 20161-NOS AS OF UT/OR/AS

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REPUNT PLASON: 2MU QUARTER 1983 YEAR-IO-UALF

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REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM	
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4 TITLE (and Substitle)	S. TYPE OF REPORT & PERIOD COVERED	
The Uniform Chart of Accounts: A Description With Comments on Potential Use With Case Mix Data		
	6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(e)	6. CONTRACT OR GRANT NUMBER(s)	
Rosalie J. Hall Terrence L. Kay		
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18. SUPPLEMENTARY NOTES		
10. KTV WORRS (Continue on control of a 11 accesses and the life to the control of the life to the lif		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Uniform Chart of Accounts		
Uniform Chart of Accounts Diagnosis Related Groups		
Case Mix		
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20. AGSTRACT (Cantinue on reverse olde if necessary and identify by black number)		
20. AGSTRACT (Continue on reverse olds if necessary and identity by block number) The Uniform Chart of Accounts (UCA) is a standardized cost accounting system developed specifically for use in military fixed medical treatment facilities. By providing a single tri-service chart of accounts with common definitions for all elements, the UCA generates a unique source of standardized data for making cost and workload comparisons among military hospitals and		
clinics.		

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20.

To interpret the UCA data, it is essential to be familiar with the basic procedure for generating the cost figures on the UCA final reports, including accumulation and purification of cost and workload data from the reporting work centers; for the redistribution of costs among work centers to reflect shared resources and indirect expenses; and for production of the summary reports. This report provides a short description of these procedures, plus comments and discussion concerning the use of other medical data such as Diagnosis Related Groups (DRGs) to supplement the UCA inpatient cost data.

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